

Appl. No. 10/720,505
Atty. Docket: 2003B127
Amendment dated December 5, 2006
Reply to Final Office Action dated October 5, 2006

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REMARKS/ARGUMENTS

Claim Status – Request for Reconsideration and Restriction

Reconsideration of this application is requested. The claims presented for reconsideration are claims 1 and 3-62.

Claims 63-106, which were previously withdrawn, have been canceled in response to the restriction requirement. Applicants reserve the right to prosecute the subject matter of those claims by way of a divisional application.

Claim 1 has been amended to include the features of now canceled claim 2 and those supported by the instant specification, *e.g.*, at paragraphs [00102] - [00104]. Claim 3 has been amended for clerical purposes. As the amendments to the claims introduce no new matter nor present any issues not previously before the Examiner, these amendments are believed to be appropriate for entry. Accordingly, entry of the amendments are requested.

Claim Rejections – 35 USC § 103

Claims 1-62 stand rejected under 35 USC § 103(a) as being obvious over U.S. Patent No. 6,482,998 to Kuechler *et al.* (hereinafter “Kuechler”), in view of U.S. Patent No. 5,744,680 to Mulvaney, III, *et al.* (hereinafter “Mulvaney”). This rejection is traversed and reconsideration is requested.

This invention is directed to a process for converting oxygenate to olefin product, which includes condensing a portion of the olefin product to provide a liquid stream rich in water and unreacted oxygenate. At least a part of the liquid stream is fed to a feed tray in a fractionation tower that separates the liquid feed into an oxygenate-rich overhead product and a water-rich liquid bottoms product. A liquid, oxygenate-rich stream that contains at least about 20 wt% oxygenate is fed to the fractionation tower above the feed tray. By this amendment, the oxygenate that is fed to the fractionation tower above the feed tray, is methanol and/or ethanol.

Kuechler discloses a process for catalytically converting a feedstock comprising an oxygenate to olefins utilizing a heat exchange device to transfer heat from at least a portion

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of an effluent of an oxygenate conversion reactor to the feedstock to cause at least a portion of the feedstock to vaporize. The portion of the effluent of the oxygenate conversion reactor that is sent to the heat exchange device and causes the feedstock to vaporize is a water-rich stream taken as an overhead stream 26 from a fractionator 24.

In rejecting the claims, it was stated at page 4 of the Office Action that "Kuechler fails to disclose the amount of oxygenate contained in the water-containing stream added to the fractionator." Nevertheless, it was concluded in the same page of the Office Action that "it is expected the amount of oxygenate contained in the water-containing stream added to the fractionator in [the] Kuechler process would at least overlap with the claimed level of at least 20 wt%." Applicants respectfully submit that both of these statements are factually incorrect.

Fig. 1 of Kuechler shows that a water-rich stream 21 is recovered from quench tower 13 and sent to a fractionator 24. The overhead from the fractionator 24 is sent through line 26, is used to heat feed in line 3 by way of heat exchanger 4, and is then sent to separator 28.

Table 2 of Kuechler provides sufficient information to determine the content of each of the streams sent to the fractionator 24. Stream 23, which is the feed stream to the fractionator 24 and is the combination of streams 21 and 22, includes about 99.8 mol% water and 0.2 mol% methanol. The overhead stream 26 from the fractionator contains about 89 mol% water and 11 mol% methanol, with the bottoms stream 33 being essentially 100 mol% water.

The only line to fractionator 24 that is above the feed line 23 is line 32, which ultimately comes as a bottoms stream from separator 28. Going into separator 28 is line 27, which originates as line 26 from the overhead of fractionator 24. As shown in Table 2 of Kuechler, essentially all of the methanol is removed from line 26 by way of line 29. This means that the line 32 contains essentially 100 mol% water. Therefore, Kuechler does not feed any oxygenate-rich stream, much less an ethanol or methanol-rich stream to the fractionation tower above the feed tray, in contrast to Applicants' claims.

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It is also not obvious to send an ethanol or methanol-rich stream to the fractionation tower, as in Applicants' claims, because ethanol and methanol are, in fact, lower boiling point compounds relative to water. Typically, streams provided above the feed injection point in fractionation towers have the same or higher boiling point compounds as the feed, which is demonstrated by Kuechler. Applicants have found, however, that by injecting a liquid, oxygenate-rich stream comprising at least about 20 wt% oxygenate above the feed tray significantly reduces heat load or condenser duty of the fractionation tower. See paragraphs [00158] and [00163] of Applicants' specification. This reduction in heat load using this type of liquid stream, and injected above the feed tray, would not have been expected by one of ordinary skill in the art. Certainly, there is nothing taught in Kuechler that would suggest any use of a 20 wt% oxygenate stream above the feed tray of the fractionator. Accordingly, there is nothing disclosed in Kuechler that would suggest Applicants' claimed invention.

Mulvaney was cited for disclosing the use of a recovery train to recover at least some of the olefin in the olefins product. Although Mulvaney does generally disclose the use of a recovery type train, Mulvaney fails to disclose the use of any liquid injection stream above the feed inlet of a fractionator. Therefore, even the combination of Mulvaney with Kuechler fails to suggest any use of a 20 wt% oxygenate stream above the feed tray of a fractionator. Accordingly, the combination of Mulvaney and Kuechler fails to suggest Applicants' claimed invention.

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CONCLUSION

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, this application is in condition for allowance. Accordingly, applicants request early and favorable reconsideration in the form of a Notice of Allowance.

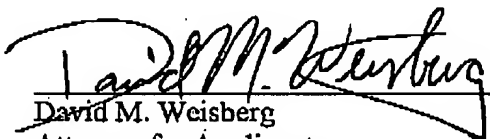
If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2003B127).

Respectfully submitted,

12/5/06

Date



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